

WHAT IS CLAIMED IS:

1. A method for fabricating a highly porous ceramic from expandable microspheres and a preceramic polymer, comprising
5 the steps of:

homogeneously mixing a preceramic polymer powder, expandable hollow microspheres and a ceramic powder, and molding the mixture to form a molded body;

heating the molded body to expand it;

10 curing the expanded molded body; and
pyrolyzing the cured molded body.

2. The method for fabricating a highly porous ceramic from expandable microspheres and a preceramic polymer according to claim 1, wherein the ceramic powder is at least
15 one material selected from the group consisting of Al₂O₃, ZrO₂, MgO, SiC, TiC, Si₃N₄, AlN, TiN, MoSi₂, WC and mixtures thereof.

20 3. The method for fabricating a highly porous ceramic from expandable microspheres and a preceramic polymer as according to claim 1, wherein the ceramic powder is added in an amount of 50% by weight or less, based on the total weight
of the starting materials.

25 4. A method for fabricating a highly porous ceramic from

expandable microspheres and a preceramic polymer, comprising
the steps of:

homogeneously mixing a preceramic polymer powder and
expandable hollow microspheres, and molding the mixture to
5 form a molded body;

heating the molded body to expand it;

curing the expanded molded body; and

pyrolyzing the cured molded body.

10 5. The method for fabricating a highly porous ceramic
from expandable microspheres and a preceramic polymer
according to claim 1 or 4, wherein the expansion of the molded
body is carried out by heating at a temperature of 110~200°C,
the temperature range between the softening point and the
15 melting point of the preceramic polymer, to expand the
expandable hollow microspheres.

20 6. The method for fabricating a highly porous ceramic
from expandable microspheres and a preceramic polymer
according to claim 1 or 4, wherein the preceramic polymer is
at least one polymer selected from the group consisting of
polycarbosilane, polysiloxane, polysilazane and mixtures
thereof.

25 7. The method for fabricating a highly porous ceramic

from expandable microspheres and a preceramic polymer according to claim 1 or 4, wherein the preceramic polymer powder is added in an amount of 20% by weight or more, based on the total weight of the starting materials.

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8. The method for fabricating a highly porous ceramic from expandable microspheres and a preceramic polymer according to claim 1 or 4, wherein the expandable hollow microspheres are added in an amount of 20% by weight or more, based on the total weight of the starting materials.

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9. The method for fabricating a highly porous ceramic from expandable microspheres and a preceramic polymer according to any one of claims 1, 4 and 9, wherein upon heating the expandable hollow microspheres to 110~200 °C at atmospheric pressure, the shell is softened and the inner medium is expanded to form spherical hollow spheres having an average diameter of 10-200 μm.

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10. A highly porous ceramic fabricated from expandable microspheres and a preceramic polymer, in accordance with the method according to claim 1 or 4 wherein the highly porous ceramic has a high porosity of not less than 60% and a pore density of not less than 10^8 pores/cm³.

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